

1

153653 Attachment A^N

Time Collected: 7:15 P.M.
Date Collected: OCT. 1, 94

SPECIAL ANALYSIS FORM

Lab # 5-35937
Date Received OCT 2 1994 cmc

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY: ST. CLAIR FILE HEADING: CAHOKIA / DEAD CREEK FILE NUMBER: 1630700005

SOURCE OF SAMPLE: (Exact Location) SAMPLE WAS COLLECTED FROM A BLACK OILY PIT JUST WEST OF THE NORTHWEST CORNER OF DEAD CREEK.

PHYSICAL OBSERVATIONS, REMARKS: JUST WEST OF SAMPLE #2. VERY THICK BLACK OILY MATERIAL DUMPED ON THE GROUND.

TESTS REQUESTED: PCB'S, ORGANIC SCAN, HEAVY METALS

COLLECTED BY: KEN MENSING TRANSPORTED BY: KEN MENSING
MIKE GRANT LABORATORY

RECEIVED BY: Hadi D. Kalthia DATE COMPLETED: DATE FORWARDED:

Cd	0.1
Cr	24.4
Cu	101.1
Fe	106
Pb	26.6
Mn	20.1
Zn	101.4
Hg	0.36
As	

IEPA - CHAMPAIGN OCT - 5 1984
Rec'd. 5013706 M

5013706
cmc

①

SF Tech
DO 55935 REPORT

Time Collected: 7:15 P.M.

Lab # ~~5-35937~~ cmc

Date Collected: OCT. 1, 84

SPECIAL ANALYSIS FORM

Date Received OCT 21 1984

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY: ST. CLAIR FILE HEADING: CAHOKIA / DEAD CREEK FILE NUMBER: 1630700005

SOURCE OF SAMPLE: (Exact Location) SAMPLE WAS COLLECTED FROM A BLACK OILY PIT JUST WEST OF THE NORTHWEST CORNER OF DEAD CREEK.

PHYSICAL OBSERVATIONS, REMARKS: JUST WEST OF SAMPLE #2. VERY THICK BLACK OILY MATERIAL DUMPED ON THE GROUND.

TESTS REQUESTED: PCB'S, ORGANIC SCAN, HEAVY METALS

COLLECTED BY: KEN MENSING TRANSPORTED BY: KEN MENSING
MIKE GRANT LABORATORY

RECEIVED BY: Harij D. K. Athia DATE COMPLETED: 11/26/84 DATE FORWARDED: 12/16/84
D. Hurley

PCBs < 16 ug/g

RECEIVED

DEC 07 1984

IEPA DLPC

35937 cmc
~~5-35937~~ cmc

Cahokia, Dead Creek

#1

from oily pit just west of #2
Very thick black oily material

D035935

COMPOUND	CONCENTRATION	COMPOUND	CONCENTRATION
0-Dichlorobenzene	ND	2-Chlorophenol	ND
Bis(2-chloroethyl) ether	"	2-Nitrophenol	"
Nitrobenzene	"	Phenol	"
Hexachlorobutadiene	"	2,4-Dimethylphenol	"
1,2,4-Trichlorobenzene	"	2,4-Dichlorophenol	"
Isophorone	"	2,4,6-Trichlorophenol	"
Naphthalene	"	4-Chloro-3-methylphenol	"
Methylnaphthalene	"	2,4-Dinitrophenol	"
Dimethylnaphthalene	"	2-Methyl-4,6-dinitrophenol	"
Trimethylnaphthalene	"	4-Nitrophenol	"
Hexachlorocyclopentadiene	"		
Acenaphthylene	"		
Dibenzofuran	"	PCBs	< 16 ug/g
Acenaphthene	"		
Fluorene	"		
2,4-Dinitrotoluene	"		
Phenanthrene	"		
Anthracene	"		
Fluoranthene	"		
Pyrene	610		
Benzidine	ND		
Chrysene	"		
Benzo (a) anthracene	"		
3,3'-Dichlorobenzidine	"		
PHENYL INDSNE	320		
DIMETHYL PHENANTHRENE	3100		
TRIMETHYL PHENANTHRENE	1400		
ALIPHATIC HYDROCARBONS	14,200		
OTHER ORGANIC COMPOUNDS	1200 (est.)		
DETECTION LIMIT	400		RECEIVED
UNITS	ug/kg (PPM)		DEC 07 1984
			EPA-DLPC

11/26/84
D. K. Miller

7

Time Collected: 7:30 P.M.

Lab # ~~1111111111~~
cmc

Date Collected: OCT. 1, 84

SPECIAL ANALYSIS FORM

Date Received _____

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY: ST. CLAIR FILE HEADING: CAHOKIA / DEAD CREEK FILE NUMBER: 11-3070 0005

SOURCE OF SAMPLE: (Exact Location) SAMPLE WAS COLLECTED FROM A BLACK OILY PIT JUST WEST OF THE NORTHWEST CORNER OF DEAD CREEK.

PHYSICAL OBSERVATIONS, REMARKS: JUST EAST OF SAMPLE # 1, VERY THICK BLACK OILY MATERIAL FLOATING ON WATER. SAMPLE CONSISTED OF BOTH THE OILY MATERIAL AND WATER.

TESTS REQUESTED: PCB'S, ORGANIC SCAN, HEAVY METALS

COLLECTED BY: KEN MENSING TRANSPORTED BY: KEN MENSING
MIKE GRANT LABORATORY

RECEIVED BY: Heidi D. Kachhica DATE COMPLETED: DATE FORWARDED:

Cd	0.8
Cr	27.2
Cu	509.0
Fe	151
Pb	52.1
Mn	20.1
Zn	339
Hg	0.46
As	

IEPA - CHAMPAIGN LAB
Rec'd.
OCT - 5 1984
5013007

7

DO 35938_{cmc}

Time Collected: 7:30 P.M.

Lab # ~~111618~~
cmc

Date Collected: OCT. 1, 84

SPECIAL ANALYSIS FORM

Date Received 11/26/84

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY: ST. CLAIR FILE HEADING: CAHOKIA / DEAD CREEK FILE NUMBER: 1630700005

SOURCE OF SAMPLE: (Exact Location) SAMPLE WAS COLLECTED FROM A BLACK OILY PIT JUST WEST OF THE NORTHWEST CORNER OF DEAD CREEK.

PHYSICAL OBSERVATIONS, REMARKS: JUST EAST OF SAMPLE # 1. VERY THICK BLACK OILY MATERIAL FLOATING ON WATER. SAMPLE CONSISTED OF BOTH THE OILY MATERIAL AND WATER.

TESTS REQUESTED: PCB'S, ORGANIC SCAN, HEAVY METALS

COLLECTED BY: KEN MENSING TRANSPORTED BY: KEN MENSING
MIKE GRANT LABORATORY

RECEIVED BY: Hadiji D. Kuhlman DATE COMPLETED: 11/26/84 DATE FORWARDED: 11/26/84
Hadiji

PCBs < 5 ug/l

D035438

COMPOUND	CONCENTRATION	COMPOUND	CONCENTRATION
0-Dichlorobenzene	ND	2-Chlorophenol	ND
Bis(2-chloroethyl) ether	"	2-Nitrophenol	"
Nitrobenzene	"	Phenol	"
Hexachlorobutadiene	"	2,4-Dimethylphenol	"
1,2,4-Trichlorobenzene	"	2,4-Dichlorophenol	"
Isophorone	"	2,4,6-Trichlorophenol	"
Naphthalene	"	4-Chloro-3-methylphenol	"
Methylnaphthalene	"	2,4-Dinitrophenol	"
Dimethylnaphthalene	"	2-Methyl-4,6-dinitrophenol	"
Trimethylnaphthalene	"	4-Nitrophenol	"
Hexachlorocyclopentadiene	"		
Acenaphthylene	"		
Dibenzofuran	"		
Acenaphthene	"		
Fluorene	"		
2,4-Dinitrotoluene	"		
Phenanthrene	"		
Anthracene	"		
Fluoranthene	"		
Pyrene	"		
Benzidine	"		
Chrysene	"		
Benzo (a) anthracene	"		
3,3'-Dichlorobenzidine	"		
CHLOROBENZENE	580		
ALIPHATIC HYDROCARBONS	5230		
OTHER ORGANICS	400 (L.F.)		
DETECTION LIMIT	250		
UNITS	ug/l (PPB)		

11/26/84
2/11/85

3

Attachment C

Time Collected: 7:40 P.M.
Date Collected: OCT. 1, 84

SPECIAL ANALYSIS FORM

Lab # ~~5013708~~ cmc
Date Received OCT 2 1984

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY: ST. CLAIR FILE HEADING: CAHOKIA / DEAD CREEK FILE NUMBER: 1630700005

SOURCE OF SAMPLE: (Exact Location) SAMPLE WAS A COMPOSITE OF SOIL AND/OR WASTE MATERIALS IN THE GENERAL AREA OF SAMPLES #1 AND #2.

PHYSICAL OBSERVATIONS, REMARKS:

SEVERAL MATERIALS FROM A WHITISH SUBSTANCE TO A DARK BROWN FINE POWDER LIKE MATERIAL WERE OBTAINED.

TESTS REQUESTED: PCB'S, ORGANIC SCAN, HEAVY METALS

COLLECTED BY: KENNETH MENSING TRANSPORTED BY: KEN MENSING
MIKE GRANT LABORATORY

RECEIVED BY: Hariji D. Kulkarni DATE COMPLETED: DATE FORWARDED:

Cd 16.8
Cr 30.0
~~Cu 712~~
Fe 6025 6025
~~Pb 337~~
Mn 9.9
~~Zn 104100~~
Hg 1.99
As

IEPA - CHAMPAIGN LAB
Rec'd. 5013708
OCT - 5 1984

M

~~5013708~~
cmc

(3)

35941 cmc

Time Collected: 7:40 P.M.
Date Collected: OCT. 1, 84

SPECIAL ANALYSIS FORM

Lab # ~~35941~~
Date Received OCT 2 1984

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY: ST. CLAIR FILE HEADING: CAHOKIA/DEAD CREEK FILE NUMBER: 1630700005

SOURCE OF SAMPLE: (Exact Location) SAMPLE WAS A COMPOSITE OF SOIL AND/OR WASTE MATERIALS IN THE GENERAL AREA OF SAMPLES #1 AND #2.

PHYSICAL OBSERVATIONS, REMARKS:

SEVERAL MATERIALS FROM A WHITISH SUBSTANCE TO A DARK BROWN FINE POWDER LIKE MATERIAL WERE OBTAINED.

TESTS REQUESTED: PCB'S, ORGANIC SCAN, HEAVY METALS

COLLECTED BY: KENNETH MENSING TRANSPORTED BY: KEN MENSING
MIKE GRANT LABORATORY

RECEIVED BY: Hadi D. Kalthia DATE COMPLETED: 11/26/84 DATE FORWARDED: 11/26/84
Q. Hume

PCBs = 18 ug/g (PPM)
(Aroclor 1260)

D035941

COMPOUND	CONCENTRATION	COMPOUND	CONCENTRATION
0-Dichlorobenzene	ND	2-Chlorophenol	ND
Bis(2-chloroethyl) ether	"	2-Nitrophenol	"
Nitrobenzene	"	Phenol	"
Hexachlorobutadiene	"	2,4-Dimethylphenol	"
1,2,4-Trichlorobenzene	"	2,4-Dichlorophenol	"
Isophorone	"	2,4,6-Trichlorophenol	"
Naphthalene	"	4-Chloro-3-methylphenol	"
Methylnaphthalene	"	2,4-Dinitrophenol	"
Dimethylnaphthalene	"	2-Methyl-4,6-dinitrophenol	"
Trimethylnaphthalene	"	4-Nitrophenol	"
Hexachlorocyclopentadiene	"		
Acenaphthylene	"		
Dibenzofuran	"		
Acenaphthene	"		
Fluorene	"		
2,4-Dinitrotoluene	"		
Phenanthrene	"		
Anthracene	"		
Fluoranthene	"		
Pyrene	"		
Benzidine	"		
Chrysene	"		
Benzo(a)anthracene	"		
3,3'-Dichlorobenzidine	"		
OTHER ORGANICS	4070		
DETECTION LIMIT	10		
UNITS	mg/kg (PPM)		
	00		

11/26/84

The Disposal Impoundment

As seen in a 1973 map by the U.S.A.C.E. (St.Louis District), the area of the disposal impoundment is approximately 20,000 square feet. The wastes dumped into it and the later leaching by rain water are then sources of potential ground water pollution here.

Mr. Waggoner stated in 1971 that he used approximately 100 gallons of water per day to wash out his trucks that carried industrial waste. This is most likely a conservative estimate. He operated in this manner from August, 1971 until sometime in 1974, when he sold the company to Ruan Trucking Company, who continued the same practice until 1978. If it's assumed that they "washed their trucks out" 5 days a week during this period of time, the following estimate as to the amount of disposal can be made:

$$(100 \text{ gal/day}) \times (6.3 \text{ years}) \times (52 \text{ weeks/year}) \times (5 \text{ days/week}) = 163,800 \text{ gallons}$$

It is felt that this excavation caused large amounts of ground water pollution, as seen from the above value, and from the drilling of monitor well G109 (Figure 4). While drilling it, the driller and his assistant operating the rig became nauseous from the fumes. These conditions were due to its location in a small strip of virgin soil between the creek and the disposal impoundment. Since the soils above the water table are relatively clean until encountering the ground water, and no mounding is shown at this well location, it must be assumed that the disposed liquids migrated vertically from the impoundment. Upon encountering the ground water table, pollutants traveled in the direction of ground water flow (to the west), and reached well G109.

The Pond Occupying H. H. Hall Construction's Sand Pit

The water level in this pond is 1.5 to 2.0 feet higher than the closest wells to it (G111, G105), therefore, it is assumed that the water in the pond has no hydrological connection to the ground water aquifer. Since this pit was excavated to obtain the Henry Formation sands, it at one time must have extended down to the aquifer. The only explanation for this breach then, is that the pond has silted in to the point where the water in the pond is of a perched nature. This silting action occurred in the same way as that previously described for the creek bottom. Evidence for the deposition of this silt fill in recent times occurs at the Judith Lane culvert. This culvert (with a diameter of 6 feet) was installed in the early 1950's to allow for better creek flow under the road. Subsequent sedimentation in the creek has filled to within one foot of the top of this culvert. This means that the water level in the pond fluctuates independently of the ground water aquifer.

Water Quality

Ground Water

The monitoring wells installed by the IEPA have been sampled twice during this study. The location of these wells are shown on Figure 4, and analysis results are presented in Tables 4a and 4b. In addition to these wells, four private wells (Figures 4 and 8) have been sampled to establish the background quality. Water samples were collected and preserved according to the Agency standards, however, the samples were not filtered. Analysis for the background is in

Table 4b. Analysis of ground water samples from the IEPA monitoring wells on 1/28/81 in ppm except when noted

PARAMETERS	STANDARDS	G101	G102	G103	G104	G105	G106	G107	G108	G109	G110	G111	G112
Alkalinity	NE	447	421	266	520	363	556	621	448	18	308	394	619
Ammonia	1.5	0.3	0.0	1.4	0.2	0.7	3.3✓	1.0	0.0	17✓	0.2	0.1	0.5
Arsenic	0.05	0.015	0.016	0.018	0.002	0.037	0.11	0.021	0.004	7.5✓	0.013	0.014	0.027
Barium	1.0	0.9	1.2✓	0.9	0.3	1.8✓	1.0	3.2✓	0.5	0.2	1.0	0.7	0.5
Boron	1.0	0.3	0.4	0.4	0.7	0.4	0.5	0.5	0.2	0.8	0.2	0.6	0.9
Cadmium	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14✓	0.00	0.00	0.00
Calcium	NE	220.0	328.9	176.3	218.0	319.2	225.5	1169.5	205.5	466.7	169.4	181.4	198.3
C.O.D.	NE	45	93	56	9	143	212	635	8	1315	37	28	47
Chloride	250	20	128	64	29	59	156	201	76	32	36	18	210
Chromium (total)	1.05	0.02	0.02	0.02	0.00	0.03	0.00	0.09	0.00	0.04	0.02	0.02	0.00
Chromium (+6)	0.05	NA	NA	NA	NA	NA	NA						
Copper	0.02	0.59✓	0.79✓	0.36✓	0.14✓	0.43✓	0.29✓	0.97✓	0.00	94.1✓	0.11✓	0.04✓	0.28✓
Cyanide	0.025	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Fluoride	1.4	NA	NA	NA	NA	NA	NA						
Hardness	NE	554	1072	490	717	764	617	960	564	2144	447	530	486
Iron	1.0	30.4✓	16.5✓	20.8✓	1.4✓	60.8✓	67.5✓	172✓	0.3	198✓	19.1✓	10.7✓	18.9✓
Lead	0.05	0.17✓	0.08✓	0.00	0.00	0.07✓	0.00	0.32✓	0.00	0.00	0.00	0.00	0.00
Magnesium	NE	48.2	78.0	46.3	49.1	73.6	49.1	288.1	34.3	184.4	43.5	37.9	54.0
Manganese	0.15	3.02✓	3.15✓	3.07✓	1.41✓	4.10✓	2.13✓	9.64✓	0.34✓	8.30✓	0.77✓	1.76✓	2.78✓
Mercury	.0005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0004	0.0	0.0	0.0
Nichel	1.0	0.1	0.1	0.4	0.0	0.2	0.0	0.5	0.0	176✓	0.9	0.0	0.0
Nitrate - nitrite	10.0	0.0	2.5	0.1	0.5	0.0	0.0	0.2	3.5	0.3	18✓	0.5	0.0
pH	6.5 - 9.0	7.0	7.0	7.1	7.2	7.0	6.9	6.9	7.1	4.1✓	6.9	7.0	6.9
Phenolics	.001	0.0	0.0	0.0	0.0	0.0	1.46✓	0.5✓	0.01✓	1.86✓	0.02✓	0.015✓	0.05✓
Phosphorous	0.05	0.91✓	0.88✓	0.41✓	0.06✓	3.6✓	2.1✓	10✓	0.03	3.7✓	1.0✓	0.51✓	0.53✓
Potassium	NE	6.4	12	8.8	6.0	13	6.2	20	16	18	7.5	4.2	20
R. O. E.	500	NA	NA	NA	NA	NA	NA						
Selenium	0.01	0.002	0.002	0.002	0.002	0.003	0.002	0.011✓	0.004	0.006	0.016✓	0.002	0.0
Silver	.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sodium	NE	13	63	48	15	50	94	60	30	37	13	14	18
S.C.	NE	NA	NA	NA	NA	NA	NA						
Sulfate	250	129	583✓	256✓	265✓	468✓	143	276✓	86	3371✓	57	153	212
Zinc	1.0	0.3	1.2✓	1.8✓	0.1	1.5✓	0.1	1.5✓	0.0	10.1✓	2.0✓	0.1	2.8✓
PCB (ppb)	NE	0.22✓	3.9✓	NA	0.3✓	BDL	NA	0.4✓	BDL	NA	NA	NA	BDL
Chlorobenzene (ppb)	NE	NA	NA	NA	NA	NA	NA	63✓	BDL	BDL	NA	NA	25✓
Dichlorophenol (ppb)	NE	NA	NA	NA	NA	NA	NA	560✓	BDL	BDL	NA	NA	BDL
Chloroaniline (ppb)	NE	NA	NA	NA	NA	NA	NA	90✓	BDL	BDL	NA	NA	21✓

✓ indicates above standard amounts

NA= Not Attempted

NE=Not Established

BDL= Below Detection Level

Attachment E

Table 3. Ground water quality in private wells (background), concentrations in ppm except where noted

Parameters	Ground water standards	Collection date and well number			
		9/16/80	9/16/80	9/16/80	9/23/80
		G501	G502	G503	G504
Arsenic	0.05	0.008	0.004	0.001	< 0.001
Barium	1.0	0.2	0.16	0.39	0.05
Boron	1.0	0.28	0.27	0.25	0.58
Cadmium	0.01	< 0.001	< 0.005	< 0.002	< 0.002
Chromium	1.05	< 0.01	< 0.005	< 0.01	NA
Copper	0.02	0.02	< 0.005	< 0.005	0.06
Iron	1.0	4.6	19.0	17.7	0.73
Lead	0.05	< 0.02	< 0.02	< 0.05	< 0.04
Magnesium	NE	33.0	39.0	36.0	30.0
Manganese	0.15	1.02	1.26	0.79	0.65
Mercury	0.0005	< 0.0001	< 0.0001	< 0.0001	0.0001
Nickel	1.0	< 0.005	< 0.0005	< 0.01	0.02
Phosphorus	0.05	< 1.0	< 1.0	< 1.0	0.2
Potassium	NE	6.6	5.7	4.5	6.0
Silver	0.0005	< 0.005	< 0.005	< 0.005	< 0.01
Sodium	NE	21.0	24.0	12.0	26.0
Zinc	1.0	0.85	NA	0.18	0.8
PCB (ppb)	NE	NA	NA	NA	< 0.1

NE - Not established
 NA - Not attempted

Table 4a. Analysis of ground water samples from the IEPA monitoring wells on 10/23/80 in ppm except when noted

PARAMETERS	STANDARDS	G101	G102	G103	G104	G105	G106	G107	G108	G109	G110	G111	G112
Alkalinity	NE	362	410	336	406	271	387	552	375	287	210	302	699
Ammonia	1.5	0.3	1.6 ✓	1.7 ✓	0.4	0.9	2.9 ✓	0.5	0.3	4.5 ✓	1.2	0.1	1.5
Arsenic	.05	.023	.023	.045	.049	.067 ✓	.16 ✓	.043	.008	.055 ✓	.053 ✓	.008	.019
Barium	1.0	1.3 ✓	0.8	2.9 ✓	2.2 ✓	2.0 ✓	0.6	2.1 ✓	0.3	0.2	0.5	0.2	0.5
Boron	1.0	0.5	0.4	0.5	0.6	0.4	0.5	0.5	0.4	0.4	0.5	0.5	5.6 ✓
Cadmium	.01	0.0	0.0	.03 ✓	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.5	5.6 ✓
Calcium	NE	180	210	210	210	340	185	500	140	0.0	1.5 ✓	0.0	.06 ✓
C.O.D.	NE	237	160	244	206	473	115	1070	298	380	500	110	242
Chloride	250	48	103	58	52	65	109	132	79	69	61	32	162
Chromium (total)	1.05	.04	.02	.09	.04	.12	.01	.07	0.0	0.0	0.38	0.0	363 ✓
Chromium (+6)	.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.01
Copper	.02	.46 ✓	.13 ✓	.11 ✓	.31 ✓	.73 ✓	.44 ✓	.68 ✓	.04 ✓	.13 ✓	2.3 ✓	.04 ✓	0.0
Cyanide	.025	NA	0.0										
Fluoride	1.4	0.4	0.7	0.7	0.3	1.0	0.7	0.7	0.3	1.2	0.8	0.3	0.5
Hardness	NE	501	884	549	630	528	637	777	496	1664	279	419	1080
Iron	1.0	51.0 ✓	38.5 ✓	86 ✓	89 ✓	18 ✓	62 ✓	13 ✓	4.1 ✓	39.0 ✓	340 ✓	5 ✓	18 ✓
Lead	.05	.19 ✓	.15 ✓	0.26 ✓	0.2 ✓	0.31 ✓	0.0	0.27 ✓	0.0	0.0	7.3 ✓	0.07 ✓	0.44 ✓
Magnesium	NE	69	90	79	72	100	49	205	24	100	209	24	82.5
Manganese	.15	5.1 ✓	3.8 ✓	4.2 ✓	3.4 ✓	4.2 ✓	1.9 ✓	9.8 ✓	0.98 ✓	4.5 ✓	8.8 ✓	1.1 ✓	3.9 ✓
Mercury	.0005	0.0	0.0	.0002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0001
Nickel	1.0	0.1	0.1	0.9	0.1	0.8	0.1	0.3	0.0	0.5	1.9 ✓	0.0	.0001
Nitrate-nitrite	10.0	0.1	0.1	0.1	0.4	0.0	0.1	0.1	1.1	0.0	0.4	0.5	0.0
pH	6.5-9.0	6.6	6.6	6.5	6.6	6.6	6.5	6.4 ✓	6.6	6.3 ✓	6.7	7.0	6.4 ✓
Phenolics	.001	0.0	.01 ✓	0.0	.005 ✓	0.0	.065 ✓	2.5 ✓	.01 ✓	.45 ✓	.015 ✓	0.0	.875 ✓
Phosphorus	.05	2.9 ✓	1.2 ✓	3.3 ✓	2.7 ✓	6.0 ✓	1.8 ✓	9.4 ✓	.18 ✓	.72 ✓	16 ✓	.24 ✓	.69 ✓
Potassium	NE	10.6	13.1	13.4	12.3	22	7.7	152	13.7	14.9	29	4.9	58
R.O.E.	500	650 ✓	1230 ✓	765 ✓	790 ✓	824 ✓	1020 ✓	1230 ✓	704 ✓	2460 ✓	508 ✓	512 ✓	2190 ✓
Selenium	.01	.003	.001	.004	.01	.008	.001	.004	.001	.001	.005	.002	.001
Silver	.005	.01 ✓	0.0	.02 ✓	0.0	0.0	0.0	0.0	.01 ✓	0.0	0.0	.02 ✓	.11 ✓
Sodium	NE	24	60	40	29	57	96	NA	40	40	53	24	260
S.C.	NE	870	1560	1050	1080	1040	1340	1430	960	2470	720	490	NA
Sulfate	250	132	434 ✓	230	204	296 ✓	281 ✓	201	103	1348 ✓	93	104	518 ✓
Zinc	1.0	0.6	0.4	6.2 ✓	0.3	3.7 ✓	0.1	0.8	0.0	0.1	9.0 ✓	0.0	7.8 ✓
PCB (ppb)	NE	1.0 ✓	1.2 ✓	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.7 ✓	< 0.1	< 0.1
Chlorophenol (ppb)	NE	BDL	1200 ✓	BDL	BDL	BDL	BDL	630 ✓	BDL	19 ✓	BDL	BDL	BDL
Chlorobenzene (ppb)	NE	BDL	BDL	BDL	BDL	BDL	BDL	19 ✓	BDL	BDL	BDL	BDL	BDL
Dichlorobenzene (ppb)	NE	BDL	BDL	BDL	BDL	BDL	BDL	25 ✓	BDL	BDL	BDL	BDL	100 ✓
Dichlorophenol (ppb)	NE	BDL	BDL	BDL	BDL	BDL	BDL	890 ✓	BDL	BDL	BDL	BDL	65 ✓
Cyclohexanone (ppb)	NE	BDL											
Chloroaniline (ppb)	NE	BDL	120 ✓	5.9 ✓	BDL	BDL							

✓ indicates above standard amounts

NA=Not Attempted

NE=Not Established

BDL=Below Detection Limit

3500 ✓

Table 4b. Analysis of ground water samples from the IEPA monitoring wells on 1/28/81 in ppm except when noted

PARAMETERS	STANDARDS	G101	G102	G103	G104	G105	G106	G107	G108	G109	G110	G111	G112
Alkalinity	NE	447	421	266	520	363	556	621	448	18	308	394	619
Ammonia	1.5	0.3	0.0	1.4	0.2	0.7	3.3 ✓	1.0	0.0	17 ✓	0.2	0.1	0.5
Arsenic	0.05	0.015	0.016	0.018	0.002	0.037	0.11	0.021	0.004	7.5 ✓	0.013	0.014	0.027
Barium	1.0	0.9	1.2 ✓	0.9	0.3	1.8 ✓	1.0	3.2 ✓	0.5	0.2	1.0	0.7	0.5
Boron	1.0	0.3	0.4	0.4	0.7	0.4	0.5	0.5	0.2	0.8	0.2	0.6	0.9
Cadmium	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14 ✓	0.00	0.00	0.00
Calcium	NE	220.0	328.9	176.3	218.0	319.2	225.5	1169.5	205.5	466.7	169.4	181.4	198.3
C.O.D.	NE	45	93	56	9	143	212	635	8	1315	37	28	47
Chloride	250	20	128	64	29	59	156	201	76	32	36	18	210
Chromium (total)	1.05	0.02	0.02	0.02	0.00	0.03	0.00	0.09	0.00	0.04	0.02	0.02	0.00
Chromium (+6)	0.05	NA	NA	NA	NA	NA	NA						
Copper	0.02	0.59 ✓	0.79 ✓	0.36 ✓	0.14 ✓	0.43 ✓	0.29 ✓	0.97 ✓	0.00	94.1 ✓	0.11 ✓	0.04 ✓	0.28 ✓
Cyanide	0.025	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Fluoride	1.4	NA	NA	NA	NA	NA	NA						
Hardness	NE	554	1072	490	717	764	617	960	564	2144	447	530	486
Iron	1.0	30.4 ✓	16.5 ✓	20.8 ✓	1.4 ✓	60.8 ✓	67.5 ✓	172 ✓	0.3	198 ✓	19.1 ✓	10.7 ✓	18.9 ✓
Lead	0.05	0.17 ✓	0.08 ✓	0.00	0.00	0.07 ✓	0.00	0.32 ✓	0.00	0.00	0.00	0.00	0.00
Magnesium	NE	48.2	78.0	46.3	49.1	73.6	49.1	288.1	34.3	184.4	43.5	37.9	54.0
Manganese	0.15	3.02 ✓	3.15 ✓	3.07 ✓	1.41 ✓	4.10 ✓	2.13 ✓	9.64 ✓	0.34 ✓	8.30 ✓	0.77 ✓	1.76 ✓	2.78 ✓
Mercury	.0005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0004	0.0	0.0	0.0
Nichel	1.0	0.1	0.1	0.4	0.0	0.2	0.0	0.5	0.0	176 ✓	0.9	0.0	0.0
Nitrate - nitrite	10.0	0.0	2.5	0.1	0.5	0.0	0.0	0.2	3.5	0.3	18 ✓	0.5	0.0
pH	6.5 - 9.0	7.0	7.0	7.1	7.2	7.0	6.9	6.9	7.1	4.1 ✓	6.9	7.0	6.9
Phenolics	.001	0.0	0.0	0.0	0.0	0.0	1.46 ✓	0.5 ✓	0.01 ✓	1.86 ✓	0.02 ✓	0.015 ✓	0.05 ✓
Phosphorous	0.05	0.91 ✓	0.88 ✓	0.41 ✓	0.06 ✓	3.6 ✓	2.1 ✓	10 ✓	0.03	3.7 ✓	1.0 ✓	0.51 ✓	0.53 ✓
Potassium	NE	6.4	12	8.8	6.0	13	6.2	20	16	18	7.5	4.2	20
R.O.E.	500	NA	NA	NA	NA	NA	NA						
Selenium	0.01	0.002	0.002	0.002	0.002	0.003	0.002	0.011 ✓	0.004	0.006	0.016 ✓	0.002	0.0
Silver	.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sodium	NE	13	63	48	15	50	94	60	30	37	13	14	18
S.C.	NE	NA	NA	NA	NA	NA	NA						
Sulfate	250	129	583 ✓	256 ✓	265 ✓	468 ✓	143	276 ✓	86	3371 ✓	57	153	212
Zinc	1.0	0.3	1.2 ✓	1.8 ✓	0.1	1.5 ✓	0.1	1.5 ✓	0.0	10.1 ✓	2.0 ✓	0.1	2.8 ✓
PCB (ppb)	NE	0.22 ✓	3.9 ✓	NA	0.3 ✓	BDL	NA	0.4 ✓	BDL	NA	NA	NA	BDL
Chlorobenzene (ppb)	NE	NA	NA	NA	NA	NA	NA	63 ✓	BDL	BDL	NA	NA	25 ✓
Dichlorophenol (ppb)	NE	NA	NA	NA	NA	NA	NA	560 ✓	BDL	BDL	NA	NA	BDL
Chloroaniline (ppb)	NE	NA	NA	NA	NA	NA	NA	90 ✓	BDL	BDL	NA	NA	21 ✓

✓ indicates above standard amounts

NA= Not Attempted

NE=Not Established

BDL= Below Detection Level

Table 1. Chemical analysis of soils (in ppm, dry weight material)

Parameters	Sample number ↓						
	X101	X102	X103	X104	X105	X106	X107
Aluminum	12,000	NA	NA	NA	NA	NA	NA
Arsenic	26.0	NA	NA	NA	NA	NA	6,000
Barium	1,300	4,700	210	390	475	NA	4,800
Beryllium	<4.0	3.0	<0.5	2.0	<1.0	NA	<1.0
Boron	<10.0	76.0	<10.0	<10.0	<10.0	NA	NA
Cadmium	<40.0	50.0	8.0	31.0	2.0	NA	70.0
Calcium	24,000	5,300	210,000	16,000	13,000	NA	11,000
Chromium	400	50.0	60.0	50.0	<50.0	NA	360
Cobalt	40.0	32.0	6.0	8.0	9.0	NA	30.0
Copper	15,000	17,200	320	1,800	360	NA	32,000
Iron	57,000	110,000	11,000	19,000	18,000	NA	70,000
Lead	800	1,300	260	250	75.0	NA	2,400
Magnesium	7,100	2,000	10,000	5,100	3,300	NA	2,900
Manganese	600	170	210	160	200	NA	150
Mercury	1.2	NA	NA	NA	NA	NA	NA
Nickel	2,000	2,300	45.0	600	<50.0	NA	3,500
Phosphorus	NA	6,200	720	1,200	4,200	NA	7,040
Potassium	2,400	900	1,400	2,100	1,400	NA	1,200
Silver	<100	45.0	10.0	<10.0	<10.0	NA	40.0
Sodium	800	1,100	100	190	125	NA	1,700
Strontium	100	140	210	47.0	43.0	NA	180
Vanadium	<80.0	50.0	22.0	31.0	35.0	NA	60.0
Zinc	12,000	21,000	900	5,600	780	NA	25,000
PCB	.120	.120	2.8	2.0	<.050	5,200	120
Aliphatic hydrocarbons	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Alkylbenzenes	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloronitrobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dichlorophenol	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Hydrocarbons	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalenes	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 1. Chemical analysis of soils (in ppm, dry weight material) (cont)

Parameters	Sample number						
	X108	X109	X110	X111	X112	X113	X114
Aluminum	8,000	9,100	7,000	8,000	6,600	10,000	6,400
Arsenic	44.0	25.0	67.0	80.0	50.0	300	23.0
Barium	3,800	1,600	4,300	1,800	8,000	2,400	1,600
Beryllium	<4.0	<4.0	<4.0	<5.0	<5.0	<5.0	<3.0
Boron	<10.0	<10.0	<10.0	<15.0	<15.0	NA	<7.0
Cadmium	<30.0	200	40.0	100	100	400	<10.0
Calcium	10,000	24,000	16,000	13,000	30,000	11,000	14,000
Chromium	300	<40.0	140	50.0	50.0	250	400
Cobalt	30.0	20.0	<20.0	<30.0	30.0	100	<20.0
Copper	31,000	7,700	22,000	15,000	41,000	3,800	4,800
Iron	58,000	75,000	67,000	68,000	52,000	365,000	55,000
Lead	2,000	1,700	2,000	2,000	5,100	3,600	2,000
Magnesium	3,900	3,600	4,100	4,000	4,000	4,000	2,800
Manganese	150	300	200	160	300	120	130
Mercury	1.7	3.0	3.3	3.2	6.0	30	1.7
Nickel	3,000	900	1,900	2,000	2,700	2,500	1,700
Phosphorus	NA	NA	NA	NA	NA	NA	NA
Potassium	1,500	1,700	1,300	1,600	1,200	1,400	1,300
Silver	<80.0	<50.0	<90.0	<50.0	<100	<100	<70.0
Sodium	900	900	700	1,000	1,600	2,800	700
Strontium	200	130	160	160	430	180	140
Vanadium	<70.0	<80.0	70.0	100	<50.0	<100	<50.0
Zinc	22,000	27,000	25,000	47,000	52,000	61,000	20,000
PCB	NA	NA	NA	NA	NA	NA	NA
Aliphatic hydrocarbons	NA	NA	NA	NA	NA	NA	NA
Alkylbenzenes	NA	NA	NA	NA	NA	NA	NA
Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
Dichlorophenol	NA	NA	NA	NA	NA	NA	NA
Hydrocarbons	NA	NA	NA	NA	NA	NA	NA
Naphthalenes	NA	NA	NA	NA	NA	NA	NA
Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA

Table 1. Chemical analysis of soils (in ppm, dry weight materials) (cont)

Parameters	Sample number						
	X115	X116	X117	X118	X119	X120	X121
Aluminum	9,000	9,000	1,300	1,200	NA	NA	NA
Arsenic	18.0	9.0	16.0	15.0	NA	NA	NA
Barium	3,400	300	400	1,600	510	1,200	230
Beryllium	<7.0	<2.0	<2.0	<2.0	1.0	1.0	<1.0
Boron	<20.0	<20.0	<10.0	6.0	<10.0	<10.0	<10.0
Cadmium	120	<20.0	<30.0	<20.0	7.0	3.0	1.0
Calcium	11,000	5,000	1,600	6,000	7,300	72,000	11,000
Chromium	120	130	<40.0	<30.0	36.0	38.0	<10.0
Cobalt	40.0	<10.0	<20.0	<4.0	9.0	10.0	9.0
Copper	22,000	270	160	1,000	100	150	100
Iron	40,000	12,000	2,400	4,300	17,500	16,200	16,500
Lead	3,200	80.0	<40.0	100	43.0	60.0	<20.0
Magnesium	5,000	2,600	1,200	1,000	4,500	4,300	5,900
Manganese	150	60	40.0	50.0	260	350	370
Mercury	4.0	0.2	2.0	2.0	NA	NA	NA
Nickel	2,400	140	<20.0	<15.0	<10.0	80.0	120
Phosphorus	NA	NA	NA	NA	NA	NA	NA
Potassium	1,500	2,300	850	1,200	1,800	1,200	1,500
Silver	<100	<50.0	50.0	<50.0	<10.0	<10.0	<10.0
Sodium	1,100	360	150	180	110	225	80.0
Strontium	200	40.0	<30.0	<30.0	42.0	140	32.0
Vanadium	150	<50.0	<40.0	<50.0	27.0	27.0	25.0
Zinc	71,000	2,500	<50.0	300	2,000	700	230
PCB	NA	NA	NA	NA	1.1	80.0	<.05
Aliphatic hydrocarbons	NA	NA	NA	NA	BDL	BDL	BDL
Alkylbenzenes	NA	NA	NA	NA	BDL	BDL	BDL
Dichlorobenzene	NA	NA	NA	NA	BDL	BDL	BDL
Dichlorophenol	NA	NA	NA	NA	BDL	BDL	BDL
Hydrocarbons	NA	NA	NA	NA	BDL	BDL	BDL
Naphthalenes	NA	NA	NA	NA	BDL	BDL	BDL
Trichlorobenzene	NA	NA	NA	NA	BDL	BDL	BDL

Table 1. Chemical analysis of soils (in ppm, dry weight materials) (cont)

Parameters	Sample number							
	X122	X123	X124	X125	X126	X127	X128	X129
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	29.5	95.8
Barium	5,500	4,400	350	2,500	5,000	2,500	NA	NA
Beryllium	2.0	3.0	1.0	<1.0	2.0	2.0	NA	NA
Boron	<10.0	<10.0	25.0	<10.0	76.0	<10.0	NA	NA
Cadmium	35.0	40.0	4.0	6.0	70.0	50.0	50.6	22.11
Calcium	15,000	12,500	4,500	6,900	19,000	8,000	NA	13,095
Chromium	50.0	150	50.0	50.0	100	340	140	491
Cobalt	15.0	15.0	7.0	9.0	50.0	30.0	NA	NA
Copper	21,900	18,700	4,500	1,000	44,800	28,000	5.5	24,324
Iron	50,000	49,000	13,500	7,000	107,000	63,000	29,535	51,911
Lead	1,700	1,400	130	260	2,000	1,700	843	2,604
Magnesium	3,800	3,400	3,500	380	3,700	2,700	NA	2,088
Manganese	190	200	80.0	45.0	280	150	141	245
Mercury	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,700	1,600	590	130	3,000	NA	569	1,474
Phosphorus	NA	NA	NA	2,000	8,900	4,700	NA	NA
Potassium	960	950	1,000	770	860	1,000	NA	NA
Silver	30.0	30.0	6.0	<10.0	100	40.0	29.0	98.0
Sodium	630	650	100	80	1,400	700	NA	NA
Strontium	190	175	27.0	50.0	300	130	NA	NA
Vanadium	45.0	42.0	19.0	13.0	85	45.0	NA	NA
Zinc	19,900	17,700	2,600	1,500	62,000	28,000	NA	NA
PCB	540	1,100	24.0	10,000	350	73.0	2.2	13.0
Aliphatic hydrocarbons	BDL	BDL	BDL	BDL	BDL	BDL	13.0	26.0
Alkylbenzenes	BDL	BDL	BDL	370	BDL	BDL	BDL	BDL
Dichlorobenzene	0.35	23.0	BDL	660	BDL	BDL	BDL	1.7
Dichlorophenol	BDL	BDL	BDL	170	BDL	BDL	BDL	BDL
Hydrocarbons	BDL	BDL	BDL	21,000	BDL	BDL	BDL	BDL
Naphthalenes	BDL	BDL	BDL	650	BDL	BDL	BDL	BDL
Trichlorobenzene	BDL	BDL	BDL	78	BDL	BDL	BDL	BDL

NA - not attempted

BDL - below detection limit

All samples taken between 9/8/80 and 11/26/80